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# IALA’s activities concerning

# e-Navigation and related developments in the maritime domain “A road map for 2016 and beyond”

NOTE to ENAV Committee WGs: Please review the contents and comment in track changes

This document presents a high-level representation of how the overarching strategies and concepts like the former IMO Secretary General’s proposal of a Sustainable Maritime Transportation System (SMTS) [1], IMO’s e-Navigation [2; 3; 4] and IHO’s Universal Hydrographic Data Model (UHDM; S-100) [5] are applied in a coordinated manner to IALA’s remit and when relevant milestones of that IALA road map are supposed to be achieved.

An introduction into the relationship between the SMTS, e-Navigation and several of the operation/technical concepts introduced in this road map is given

* in IALA Guideline 1113 on Design and Implementation Principles for Harmonised System Architectures of Shore-based Infrastructure, culminating in its Table 2, [6] and
* in the ACCSEAS e-Navigation Architecture Report [7].

For further introduction to the application of IHO’s UHDM/S-100 framework to the IALA domain, compare IALA Guideline 1106 on Producing an IALA S-100 Product Specification [8]. Also, it is necessary to identify the emerging S-1xx specifications of IHO and their relevance to IALA’s own product specifications S-2xx.

The graphical representation in the road map has the following meaning:

* An individual *ellipse* designates a milestone when the task indicated by the road map should be completed. The different colours of the ellipses only serve editorial purposes.
* The ellipse [eventually] contains the designation of the group or entity within IALA who is responsible for the fulfilment of the tasks associated. For example: “ENAV WG2” designates the WG2 of the ENAV Committee; “VTS WG1” designates the WG1 of the VTS Committee; “PAP” designates the “Policy Advisory Panel” and so forth. *It should be noted, that the road map is IALA-wide in perspective.*
* The *arrow* designates a continuous process, where the start and/or end points of the process are be given.
* [Several Ellipses and arrows can be combined to designate several meaningful milestones within a continuous process, and their meaning is explained. This way of designation may be required for complex tasks.]

1. **Requirements derivation and traceability** ([6], Table 2, refers)
   * Contribute to/liase with the development of the Sustainable Maritime Transportation System (SMTS) (as source for requirements)

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* + Clarify user requirements as required, including shipboard user

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* + Derive system requirements, as required, from user requirements

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* + Develop scope of IALA administered S-100 products

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1. **Scoping IALA’s share in the MSPs domain** 
   * Identify those MSPs to be developed and administered by IALA
   * Liaise with relevant organizations where IALA has a supporting role

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* + Develop objective, scope and description of MSPs within IALA’s remit
  + Define the generic request-fulfillment-relationships amongst operational and/or technical services, their generic interdependencies and their generic quality parameters

1. **Development of Vessel Traffic Services MSPs**
   * Define operational/technical services within these MSPs, their request-fulfillment-relationships, their interdependencies and their quality parameters
   * Develop S-100 Product Specifications, if required, in particular on “Inter VTS Exchange Format”
   * Determine VTS’s relationship with the Single Window concept
   * Develop the concept of electronic manuals for VTS equipment
   * Develop guidance on the display of accuracy and reliability of information in relevant VTS equipment
   * Develop guidance for the harmonised display of information received from communications equipment in VTS and other relevant shore based equipment
2. **Developments of MSPs related to Aids to Navigation (MSPs postulated)**
   * Define operational/technical services within these MSPs, their request-fulfillment-relationships, their interdependencies and their quality parameters
   * Develop S-100 based Product Specifications, if required, in particular a product specification on “Aids to Navigation information”
3. **Development of MSPs related to Resilient PNT (MSPs postulated)**
   * Define operational/technical services within these MSPs, their request-fulfillment-relationships, their interdependencies and their quality parameters
   * Develop S-100 based Product Specifications, if required
4. **Develop architecture and components of a Maritime Digital Infrastructure** 
   * Develop the concept of System Wide Information Management (SWIM)
   * Develop the Maritime Cloud (MC) - describe concept (including identities, the MC Identity Register (MIR), identity management, services, the service register, security and communication links) and governance model
   * Further develop Common Shore-based System Architecture (CSSA; [9]), including generic service description, generic M2M interfacing, application notes and guidance documents
   * Develop Maritime Architecture Framework (MAF) Cube
   * Update the IALA Maritime Radiocommunications Plan
   * Develop IALA Guidance on VDES

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* + Review IALA Guidance on AIS
  + Develop S-100 based product for AIS
  + Develop S-100 based product for “AIS Application Specific Messages” and manage ASM register (web catalogue)
  + Monitor [and incorporate, as appropriate?] developments in GMDSS – post IMO GMDSS review (post 2017)
  + Liaison with ITU (WRC-19 preparation) and assistance to IALA membership for national matters)

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1. **Positioning, Navigation and Timing (PNT)**
   * Develop Recommendation on PNT relevant services
   * Develop guideline on port and harbour high accuracy systems
   * Develop guidance on techniques used for oboard PNT data processing
   * Review IALA radiobeacon DGNSS guidance, including coverage
   * Develop guidance on the Ranging (or R-) Mode of operation
   * Develop guidance on maritime use of SBAS
   * Develop guidance on eLORAN
2. **Testbeds**
   * Revise guidance on planning testbeds and reporting of testbed results
   * Establish IALA website for sharing testbed results and hosting a discussion forum

# References

[1] The Secretary-General of IMO, Mr Koji Sekimizu. *A Concept of a Sustainable Maritime Transportation System.* (Sustainable Development: IMO’s Contribution beyond Rio+20). September 2013 (World Maritime Day).

[2] IMO. ‘Strategy for the Development and Implementation of e-Navigation.’ In: IMO Maritime Safety Committee. *Report of the Maritime Safety Committee on its 85th Session.* MSC 85/26/Add.1, Annex 20, 6 January 2009.

[3] IMO. ‘Draft IMO e-Navigation Strategy Implementation Plan (SIP).’ In: IMO Sub-Committee on Navigation, Communication and Search and Rescue. *Report to the Maritime Safety Committee.* NCSR 1/28, Annex 7. 16 July 2014. Adopted by IMO MSC 94, 17-21 November 2014.

[4] IMO. ‘Development and implementation of e-navigation.’ In: IMO Maritime Safety Committee. *Report of the Maritime Safety Committee on its Ninety-fifth Session.* MSC95/22, para 19.12. 19 June 2015. Refers to MSC95/19/8, as applicable.

[5] IHO. *S-100 – Universal Hydrographic Data Model.* First released January 2010, as amended.

[6] IALA. *IALA Guideline 1113 on Design and Implementation Principles for Harmonised System Architectures of Shore-based Infrastructure;* Ed. 1; May 2015

[7] ACCSEAS Project. *ACCSEAS e-Navigation Architecture Report;* May 2015; also submitted to IALA Committees, e.g. as ENAV18-10.8.2

[8] IALA. *IALA Guideline 1106 on Producing an IALA S-100 Product Specification,* Ed. 1, December 2013

[9] IALA. *IALA Guideline 1114 on A Technical Specification for the Common Shore-based System Architecture (CSSA),* Ed. 1, May 2015